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preserved through his founding the Naval School, and through his connection with the acquisition of California and the enlargement of the rights of naturalized citizens, in the first capacity; through his recognized pre-eminence as the historian of his country; or through the grateful recognition of his forethought in founding exhibitions at Exeter, Harvard, and Worcester, posterity alone can tell.

JULIUS ERASMUS HILGARD.

THE father of the subject of this sketch was a man of brilliant mind and of high attainments. He gave up a promising judicial career in Bavaria, against the wishes of that government, because of his republican sentiments, and of his desire to find a congenial sphere of action in the ideal republic which he expected to find on this side of the ocean. Accredited to the good will of the American people by a letter of introduction from Lafayette, he emigrated to this country with a large family of children, and arrived at New Orleans in the winter of 1835. Going up the Mississippi, he purchased a farm near Belleville, St. Clair County, Illinois, and there devoted his time to farming and to the education of his children, when the latter were not engaged in the manual labor inseparable from a pioneer life in the West. His son Julius, born in Zweibrücken, January 7, 1825, received from his father instruction in the classics and in the modern languages, but soon outstripped his teacher in mathematics, and at the age of eighteen went to Philadelphia to study engineering. There, at the house of a mutual friend, he met Professor Bache.

In tracing the history of his connection with the Coast Survey, to which his life was devoted, we find a letter from young Hilgard to Bache, dated January, 1844, calling the attention of the latter to errors in the formulas used by the Coast Survey in the computation of geographical positions, and giving his own development of correct formulas. In reply, Superintendent Bache wrote to the youth of nineteen, saying, "You have overriden two of our most experienced computers, and have shown that they were seriously in error." To an offer from Bache of employment in the Survey in a subordinate capacity and at small pay, he responded that he would rather do "high work at low pay than low work at high pay," and gladly accepted the position. He entered at once upon his duties, but his formal appointment was dated December 28, 1846. His ability as a field officer in astronomical work and triangulation at once secured him the commendation of his immediate superiors and of the Superintendent. In 1851, 1852, and 1853 he was in charge of the computing division, and there again his ability was made manifest, as is shown by the report of Captain Benham, U. S. Eng., who, on assuming charge of the Coast Survey Office in 1853, reported to the Superintendent that he found the computing division the best organized division in the office.

The annual reports of the Survey contain the evidence of Hilgard's scientific activity up to 1861, when for a brief period he severed his direct connection with the Survey to embark in private enterprise. But at the outbreak of the War, when the very existence of the Survey was endangered by threatened legislation, Bache appealed to him to return to Washington and help save the Survey. Responding at once, Hilgard called upon Schuyler Colfax and Roscoe Conkling, eminent as leaders in the dominant party, and made a strong argument showing how necessary such an organization as the Coast Survey must be to the country in time of war. So searching was Roscoe Conkling's examination of Hilgard's argument that the latter mistook his earnestness for an evidence of a spirit hostile to the Survey; but to his relief and satisfaction it was soon shown that he had found a most earnest supporter in Conkling no less than in Colfax. This incident is here recorded in order to recall to the mind that, in summing up the labors of Hilgard in the cause of science, it should be remembered that it is a sufficient outcome of a life to have borne a large part in maintaining the efficiency of so great and useful an institution as the Coast Survey. In 1862, Hilgard assumed charge of the Coast and Geodetic Survey Office, and this during the war involved heavy responsibilities.

Professor Bache having become incapacitated through mental disease, the duty of directing the Survey in all its branches devolved upon Hilgard in the autumn of 1864, in addition to his labors as assistant in charge of the office. Thus he was virtually Superintendent until the appointment of a successor to Bache, in February, 1867, without reaping the reward of a formal appointment, which he richly deserved. As an estimate of his services by a critic by no means partial, and yet competent, the opinion of Bache's successor, Benjamin Peirce, is cited here: "During the illness of my lamented predecessor, the administration of the Survey fell upon the shoulders of the assistant in charge, J. E. Hilgard. The distinguished ability with which this difficult service was discharged was manifest to all. He has extended to me the benefits of this experience liberally and loyally. While I willingly acknowledge myself under deep and lasting obligations to him for the aid thus rendered me, I can also testify that in all respects he has been equally true to my predecessor, the greatness of whose reputation has not been diminished in his keeping."

Until his appointment to the superintendency, in 1881, Hilgard continued in charge of the Coast Survey Office. In addition to this duty, he virtually conducted the office of Weights and Measures, and helped in shaping the legislation in regard to the legalization of the metric system in this country. The metric standards for the States of the Union were prepared under his supervision. It was therefore fitting that he should be appointed one of the scientific delegates to represent this government in Paris at an international conference having for its object the construction of a new meter as an international standard of length. In 1872 he attended the conference and actively participated in its deliberations, and when it had been decided to establish an International Bureau of Weights and Measures at Paris, its directorship was offered to him, but declined. While in Europe on the mission just referred to, he made a determination of Transatlantic longitudes, including in his operations Paris and Greenwich. It is rather singular that the first successful telegraphic longitude determination between these great observatories should have been made by an American, and his success in this undertaking was always looked upon by him as also a diplomatic triumph.

Hilgard was a charter member of the National Academy of Sciences, and took an active part in many of the investigations made by the Academy for the government. He conducted a magnetic survey of the country, under the auspices of the Academy, with means supplied out of the Bache Fund. In 1874 he was elected President of the American Association for the Advancement of Science.

His life was in many respects burdened by misfortune; for of his four children three died young and only one lived to man's estate and then died, leaving him childless and overwhelmed by grief at a time when a fatal disease had already begun its inroads on his mental and physical strength. This disease had already seriously impaired his health when he was appointed to the superintendency in 1881, which, to use his own words, came "too late."

There can be no doubt that he was conscious of his failing strength and ability while still occupying the position of Superintendent, for on more than one occasion he gave expression to the wish that the burden of his duties might be shifted to other shoulders.

His retirement took place in 1885, and from that time on his lingering illness entailed great sufferings, and several times brought him to the point of death. From each of these attacks he rallied with less power of resistance, until death relieved him of his sufferings, on May 8, 1891.

CHRISTIAN HEINRICH FRIEDRICH PETERS.

Christian Heinrich Friedrich Peters was born on September 19, 1813, at Coldenbüttel, in the Duchy of Schleswig. He studied mathematics and astronomy at Berlin between 1832 and 1836, and, after attaining the degree of Doctor of Philosophy, continued his education under the celebrated Gauss at Göttingen. In 1838 he was engaged to assist in a scientific expedition to Sicily for investigations on Mount Etna, and was employed, after the conclusion of this work, to direct the trigonometrical survey undertaken by the Neapolitan government.

Upon the outbreak of the revolutionary movements of 1848, it became impossible for him to retain his situation without suppressing his own sentiments in favor of freedom. Unable to conceal his liberal sympathies, he was dismissed and banished. But he soon returned to take an active part in the Sicilian insurrection, during which he served under Mieroslawski, first as captain and then as major of engineers. The suppression of the insurrection left him in imminent peril of capture by the Royalists ; but he finally effected his escape to France. He next went to Turkey, in hopes of obtaining scientific employment in that country; but the outbreak of the Crimean war put an end to these expectations, and he came to the United States in 1854. Here he found employment in the Coast Survey, and subsequently, in 1858, was appointed Professor of Astronomy at Hamilton College, Clinton, New York, and Director of the Observatory connected with that institution. He retained this position until his sudden death, in 1890. On the morning of July 19 in that year, his body was found on the steps leading to the building where he had lived, and it appeared that he had died on his way home from his customary work in the Observatory.